

# 3G “ad” Work - 3G’S BREAKTHROUGH WITH MOBILE ADVERTISING

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## Abstract

*Mobile advertising was early identified as an application for mobile data. Up to today the involved players, the mobile telecommunications companies and the advertising industry are looking for innovative concepts and new revenue streams. It therefore is not obvious why current mobile advertising and marketing approaches are lacking the predicted success.*

*Taking the German market as object for analysis, the paper discusses the current problems of the mentioned industries and points out some shortcomings of the business models and approaches currently in use. For mobile advertising as the common field of activity the paper provides a solution approach based on the Situation Concept and states how successful mobile advertising could take place.*

## 1 Introduction

To better understand the need for new concepts in the area of mobile telecommunications and advertising the current problems of these industries have to be analysed. The German market situation is used to point out these problems. Following the introduction in this section the Situation Concept in mobile networks and its applications provide the focus for section 2. In section 3 a scenario for situation based mobile advertising is presented followed by a summary and outlook in section 4.

### 1.1 Mobile Telecommunications Industry

With more than 59.2 million GSM subscribers at the end of 2002 and a market size of € 23.7 billion in Germany in 2002 (Regulierungsbehörde für Post und Telekommunikation, 2003) mobile telecommunication has been one of the most successful industries in the recent years.

The high investments in 3G (Regulierungsbehörde für Post und Telekommunikation, 2000) and Wireless LAN (Heise Online, 2003) have put mobile operators in trouble as investments are currently lacking the foreseen revenues. As an illustrating key figure, related to the number of 59.2 million GSM subscribers mobile network operators in 2000 have paid an amount of € 858.6 for each potential 3G customer just for licenses. On the basis of the currently established Average Revenue per User (ARPU) which is around € 25 per month for most operators in Germany (T-Mobile, 2002 and Vodafone, 2002) it is obvious that the break-even for these investments lies far away in the future.

To increase workload on mobile data, operators are currently focussing on marketing mobile service portals and brands like i-mode, Vodafone life! or t-zones. To provide an appealing service, the newest mobile technologies such as Multimedia Messaging Service (MMS), mobile Java games or multimedia content (xHTML, video clips etc.) are applied. Nevertheless, revenue from mobile Internet, e.g. for Vodafone in Germany in 2002, is still less than 1% (Vodafone, 2002).

To obtain higher revenues with mobile data either new

revenue sources have to be identified or existing ones have to be strengthened. In the private customer segment the latter is a more problematic approach as shifts in private budgets are not likely (Statistisches Bundesamt, 2000). Mobile Advertising on the other hand, where advertising companies pay to get advertising messages to recipients, i.e. potential customers, is a promising approach for new revenue streams.

### 1.2 Advertising Industry

With € 20.1 billion market size for advertising media the advertising industry in Germany in 2002 had nearly the same economic relevance as the mobile telecommunications industry (Zentralverband der deutschen Werbewirtschaft, 2003). But the market had to cope with constantly decreasing revenues (more than minus 7% within the last two years).

Interestingly, traditional mass media as television, radio and print suffered much more from that development while interactive advertising media as the Internet had continuously and significantly grown within the last four years.

The move towards interactive advertising channels might be due to recently applied marketing concepts such as One-To-One or Permission Marketing where interactive and individualised communication channels are key success factors (Godin, 2001). While mass media leads to broad coverage and the danger of customers being overloaded by unspecific advertising messages, individualised and customer-oriented marketing becomes more and more the desired form of interaction with the customer.

New advertising media as mobile and fixed Internet also address another problem. Traditional mass media advertising has shortcomings concerning the measurements of advertising effectiveness (Trommsdorff & Becker, 2001) as well as the allocation of advertising messages. That affects cost efficiency and increase the acceptance of new advertising media.

## 2 Situation Dependency in Mobile Networks

One characteristic of the mobile industry is the exclusive control over important assets (Camponovo & Pigneur, 2003), such as licenses or mobile networks. Mobile network operators own the infrastructure that, with the Situation Concept, may provide not only the foundation for communication but also highly valuable information about its users. Public mobile cellular networks, currently in use for example in the shape of GSM, are able to determine the user's identity as well as to some degree his or her position. In mobile networks that information is usually applied only to enable routing of calls or for billing purposes.

The Situation Concept (Figge et al, 2003) is an approach for utilising the mentioned meta-data of mobile communication and is based on the idea that identity and position help to determine the user's current situation. Extended by the available time element, the knowledge about the situation is helpful when it comes to ad-hoc relationships between a mobile user and a new, previously unknown service provider, which is regularly the case in the context of mobile service provisioning.

The following paragraphs will describe in more detail the process that leads from raw technical network data to rich semantic information about the user's usage situation.

### 2.1 Situation Concept

When offering the already mentioned mobile service portals to its customers, mobile network operators typically are cooperating with external parties, so called service providers (e.g. Vivendi Universal for entertainment services or Reuters for news services). These are part of the mobile service value chain for the sake of decentralised and specialised service provisioning. The technical relation between the mobile network operator and the service provider is currently often limited to the sole Internet based connection. The mobile network operator adds only little supplemental information. When applying the Situation Concept, the involvement of the service provider changes tremendously.

In the following paragraph the determination of the situation and the interpretation is explained and how it could be made available to external service providers. Figure 1 illustrates the necessary steps and tasks.

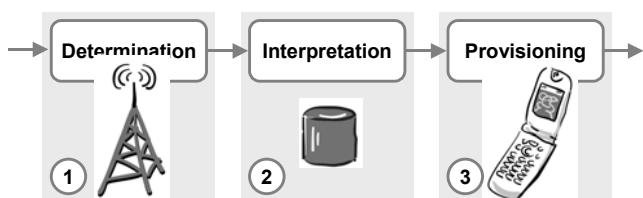


Figure 1 Situation Concept and necessary tasks

#### 2.1.1 Determination

At the time a service is requested by the mobile user the mobile network operator is able to retrieve the following user specific information:

- **Identity:** Based on the Subscriber Identity Module (SIM), the identity of the user (account) can be determined.

- **Position:** The basic technology available to determine the approximate position of a user is the Cell-Of-Origin concept (Schmidt, 2001). Other technologies may determine a more accurate position.
- **Time:** The local time can be determined by applying the already derived position and the current Universal Standard Time (UST).

At the end a technical reference to identity and position of the user as well as time of usage are available. That information can then be interpreted to retrieve more semantic information about the user's situation.

#### 2.1.2 Interpretation

The technical references being available are used within the interpretation step to multilaterally extend that information. To accomplish interpretation, databases with user specific and general information can be applied. The following listing presents only a sample of potential information sources:

- **Personal preferences:** With the help of stored user specific preferences the personal life context (e.g. student, 29 years old, interests in sport etc.) could be determined.
- **Geographic information systems:** With the help of geographic databases information such as the name of a city or country can be derived.
- **Calendar:** With the help of personal and general calendar information the current temporal context (e.g. business trip or meeting, on holiday etc.) can be determined.

As these are just examples of possible information sources, it becomes obvious that the interpretation of data can become arbitrarily complex. But it is presumed, that the user maintains most of these databases and controls the information stored in them. Therefore the derived data should be minimized with regard to the later explained applications of personalization and sponsoring (cf. section 2.2 and section 2.3) to ensure manageability.

The derived information about the user's situation is then coded within an electronic document, preferably in XML, which is then made available to the service provider.

#### 2.1.3 Provisioning

The XML document describing the situation of the user that is currently requesting a service is then transferred to the respective service provider. The user decides in advance the kind of information that is transferred as well as if her or his real world identity is revealed to the service provider. Otherwise the described procedure would be against current data security acts (Enzmann et al, 2000) and would not obtain user acceptance.

Processing that electronically processable description about the user's situation there are two applications available for the service provider, the individualisation and the sponsoring of the obtained mobile customer relationship.

## 2.2 Individualising Mobile Customer Relationships

Individualising mobile services is regarded to be a critical success factor when it comes to user acceptance of mobile services (Yom, 2002). As mobile services implement the interface between service providers and mobile users the objective is to provide an individualised mobile customer relationship. This can take place on different levels and time scales. The following paragraphs provide an overview about different approaches to individualise mobile services.

### 2.2.1 Short-Term Individualisation

The most obvious application of an available situation description is the adaptation of the user interface according to different situation properties. To show or to hide menu options or to set default values for user input are just two of many ways how the user interface can be adapted according to the user's current situation.

Rule-based matching is one of the most straightforward techniques used to individualise the presentation of a service, while other more complex approaches are also in use (Schackmann & Schü, 2001). As this kind of individualisation can take place immediately, the adaptation of the user interface is classified as short-term individualisation.

### 2.2.2 Mid-Term Individualisation

Most countries' regulation allows sending (push-) messages via Short Message Service (SMS) or Multimedia Messaging Service (MMS) only on top of a minimal personalisation, which is the previous agreement by the user to receive messages from the respective service provider (Bundesministerium der Justiz, 2003). That ensures, that the user is basically interested in the content that he or she is receiving.

On top of this agreement the Situation Concept provides a framework to define and model situation specific events. The matching of the users' situation description and a situation based event definition (for example a certain time and place constellation) is triggering a message informing the users about the respective event, e.g. that they just passed a place that they had defined to be of interest earlier.

As situation dependent notification can only take place after the agreement of the user and the definition of the user specific event, this kind of individualised notification and service provisioning is regarded to be a mid-term individualisation of mobile services.

### 2.2.3 Long-Term Individualisation

The adaptation of a service according to users' needs depends not only on behavioural aspects as mentioned before. It also relies on the design of the service. The problem most providers experience with their services is that they only have an approximate notion about how users are applying the service. The term "Analytical Customer Relationship Management" stands for collecting and analysing data about the users' behaviour to help the service provider to generate knowledge about what the users are actually doing with the services provided.

The Situation Concept at this stage helps to see the users' actions within the respective usage situation and therefore provides the data to comprehensively analyse the users' service handling. Over time this enables the service provider to adapt and change the design of a service according to the retrieved knowledge.

## 2.3 Sponsoring Mobile Customer Relationships

The data transmission costs incurred when using mobile services are a significant share of the overall usage costs for the user while the transferred data itself does not provide an obvious benefit. These costs are among other aspects (e.g. usability and usefulness) regarded to be responsible for acceptance problems of current mobile services (Yom, 2002).

Apart from individualising services on the mentioned levels the Situation Concept can also address the problem of transmission costs as it provides service providers with the ability to sponsor promising customer relationships.

When a user is requesting a mobile service, the service provider compares her or his situation description with a defined target customer profile. If there is a certain degree of conformity between the profile and the situation description, the current user is regarded to be business relevant and the service provider covers the incurring transmission costs. From an economic point of view this is reasonable, as the service provider can assume that the requesting customer will generate extra revenue at some stage of the business relationship.

In the following a scenario is used to illustrate how a service provider decides whether sponsoring data transmission is reasonable or not. In the scenario the service provider is a department store company that uses the mobile channel to attract and navigate potential customers to its stores in Berlin and Frankfurt. As the stores are open during daytime only, only requests within this time span are sponsored. The companies marketing department has also defined, that only people between 25 and 70 years are regarded as potential customers. All this information is electronically coded in a target customer profile.

In the first case (scenario A, see figure 2), a 22-years old woman in Munich requests shopping assistance through the mobile service portal of her mobile network operator at night. Accordingly the mobile network operator contacts all service providers that have subscribed their service to the shopping category of the portal. The named department store company is one of them and it therefore receives the woman's situation description together with the service request. Subsequently the description is compared to the company's target customer profile. As properties don't match the service provider does not regard the user in her current situation to be business relevant and therefore does not offer a free of charge usage of the service provided. Nevertheless, she might still use the service at her own expense if she considers it important enough.

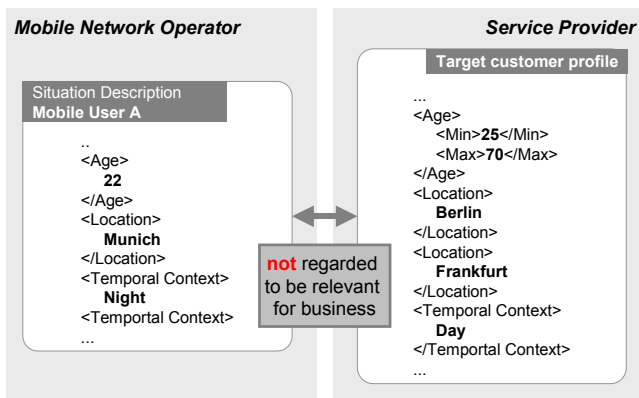


Figure 2 Scenario A - Comparing situation description and target customer profile

In a second case (scenario B, see figure 3), a 35-years old woman stays in Frankfurt during the opening hours of the department store and requests shopping services. In this case, due to the matching of all properties, the company regards her to be business relevant and covers the data transmission costs in order to provide her with a free of charge mobile service from which for instance she could check current special offers or information from the company's customer loyalty program.

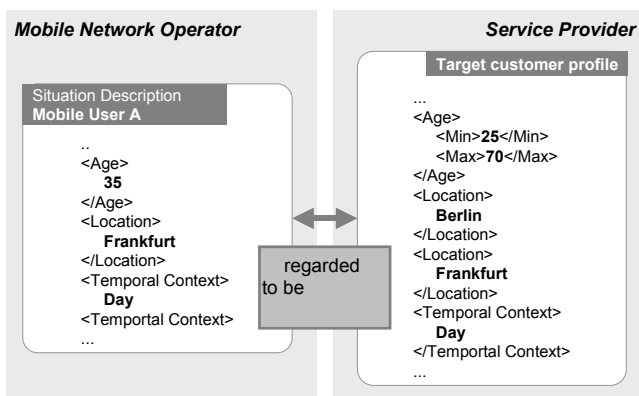


Figure 3 Scenario B - Comparing situation description and target customer profile

To limit its costs, the department store company may define a certain budget available for each mobile user. The budget may vary with the degree of conformity of the situation description and the target customer profile. It may also depend on the quality of the (potentially already existing) relationship between the department store and the user (e.g. the amount that customer spent at the department stores in the past).

With the described mechanism the service provider is able to attract customers while offering a free mobile service. Another view on sponsoring the communication costs is that service providers acquire an interaction channel from the mobile network operator to potential business relevant customers. The service provider can then offer whatever is desirable to the customer. The customer will basically accept the content, as in the first place it is free-of-charge (no data transmission costs). In addition to priced high value services (e.g. special information offerings) free-of-charge services for customer self-administration, for presenting special offers or multimedia advertising are potential candidates for mobile service offerings of a service provider. Mobile multimedia advertising shall be

presented in more detail in the next chapter.

### 3 Mobile Advertising within Sponsored Customer Relationships

As within sponsored customer relationships data transmission is free of charge for the mobile user, data intensive applications such as multimedia advertising become reasonable for the first time. Before the mobile users had to pay for content that might have had no immediate value for them. As the purpose of advertising is to encourage potential customers to perform business transactions, the distributing enterprise and not the mobile user has the primary interest in the reception of the advertising message.

Cost coverage allows mobile multimedia advertising to overcome one of its main hurdles and both industries (mobile telecommunications and advertising) can leverage its potential against traditional mass media. In the following, a feature and cost comparison presents the benefits of mobile multimedia advertising.

#### 3.1 Feature Comparison

##### 3.1.1 Traditional Mass Media Advertising

Traditional advertising channels (Althans, 1993) like television, radio and print are currently dominating the advertising market. They are well established parts of the media mix applied by enterprises to communicate with existing and potential customers. The main problems with the classical mass media are limitations concerning interaction, allocation and measuring efficiency.

Traditional mass media is at first a one-way communication and does not enable a direct response from and interaction with the recipient. Therefore mass media advertising does not allow getting into an immediate dialog with the potential customers. Furthermore, the target customer group cannot be specifically addressed. It is only feasible to choose media where it is likely that the target customer group is making up a large portion of the receptors. This results in high spreading losses and is often associated with the quotation of Lord Leverhulme "I know half the money I spend on advertising is wasted, but I can never find out which half" (Trommsdorff & Becker, 2001).

Finally, there is no direct mechanism to measure the efficiency of advertising messages distributed by traditional mass media and much effort is done to provide advertising companies with data about their campaigns (IP Deutschland, 2002).

##### 3.1.2 Mobile Multimedia Advertising

Compared to the features of traditional mass media advertising, mobile multimedia advertising can provide the following features:

- **Exclusiveness:** Unlike watching television or listening to the radio, mobile subscribers are used to spend exclusive attention when interacting with their mobile device.
- **Location- and situation-dependency:** When using mobile infrastructures, it is possible to generate

situation-dependent offers for potential customers (cf. section 2.2.).

- **Addressing target customers:** By using the mobile channel and by comparing mobile users' (customers') situations with some kind of electronic target customer profile, individually addressing customers becomes feasible (cf. section 2.3.).
- **Immediate transaction:** Mobile services offer value that can be delivered directly to the mobile device (e.g. information services) or at least initiate and arrange later business transactions (e.g. navigation to the point-of-sale or by delivering coupons). Therefore an immediate transaction after having received an advertising message can take place.
- **Measurement of campaigns' effectiveness:** Due to the feature of immediate transactions, measuring the success of advertising campaigns is much easier than in traditional mass media. As the reaction of the recipient can be clearly related to the advertising message the success of that message can be analysed.

Even though these features are very promising, it is likely that mobile multimedia advertising will not substitute but supplement classic media channels in terms of a balanced media mix.

### 3.2 Cost Comparison

Costs are another significant factor in the comparison between different advertising media. In the following costs distributing a 30-seconds advertising clip with sound and video components are compared between television and 3G networks. For this comparison one distribution channel is a German television station. The other channel is a 3G network. As the latter is not available in its final shape (3G operation in Germany will start at the end of 2003), assumptions on the basis of current GPRS data rates will be made.

#### 3.2.1 Distribution Using Television

As in all traditional mass media, costs for distributing an advertising clip through television are based on exposure based pricing models, where costs depend on the total number of impressions. A common pricing model is the cost-per-thousand (CPM) concept (Marketing Terms, 2003). The more spectators are watching, the higher is the price the advertising company has to pay. The CPM for television varies dramatically and depends on the time slot, target group and the television station to which the spot is allocated. For example the lowest CPM in Germany in May 2003 has been € 1.54 for an allocation in the very early morning program while the highest CPM has been € 331.35 for an allocation in the evening prime time (IP Deutschland, 2003). The average CPM in Germany in 2002 was € 9.94 and is thereby nearly the same as the average CPM in the EU, which was € 9.69 (Arbeitsgemeinschaft Fernsehforschung, 2003).

By analysing pricing models in the television advertising market, it becomes clear that pricing is based on assumptions and statistic evaluation. One knows only very little about the quality and characteristics of the acquired contacts.

#### 3.2.2 Distribution Using 3G Networks

The calculation of the CPM for the distribution over 3G networks is based on some assumptions. T-Mobile has announced that its current GPRS rates are the same as for 3G based data transmission (T-Mobile, 2003). Therefore current GPRS tariffs provide the foundation for the price calculation.

A video according to the Sub Quarter Common Interchange Format (SubCIF) of the ITU H.261 standard (International Telecommunication Union, 1993) has a resolution of 128x96 pixels. A frame rate of 15 pictures per second should provide a reasonable quality. To stream such a video an MPEG4 coding is applied and needs a data rate of 25 - 60 kbps. Extended by a mono audio channel within an mp3 coding, another 16 kbps are necessary. To combine audio and video in one media stream a format like the Advanced Streaming Format developed by Microsoft is used and leads to an average bandwidth need of 64 kbps. That bandwidth for 30 seconds results a data volume of 234 Kilobyte for the whole streamed advertising clip. The numbers show that current GPRS networks are not capable to provide the necessary bandwidth for adequately streaming such a multimedia clip (GSM World, 2003). 3G therefore is the prerequisite for mobile multimedia advertising.

To calculate costs for one advertising clip, it is assumed that the advertising company, i.e. the service provider, is buying data volume from the mobile network operator on a lump sum. A current GPRS tariff acquiring the maximum amount of data in advance states a price of € 29.95 for 20 Megabyte (T-Mobile, 2003). So the price for 1 Megabyte is € 1.49. Consequently, the price for the transferred advertising clip with 234 Kilobyte ends up being € 0.34. The respective CPM for the mobile transmission of the advertising clip is therefore € 342.75.

Focussing on CPM, one can see that the mobile channel is still more expensive than prime time television. But one has to keep in mind that the distribution paid by the service provider only takes place if a target customer profile and the situation description of the customer do match. Therefore spreading losses are minimised and the average "quality" of acquired contacts is much higher than in traditional mass media that can offer only weak customer targeting and allocation mechanisms. In a long-term perspective this can lead to a distribution through the mobile channel that is more cost efficient than traditional mass media.

### 3.3 Open Problems

There are still open and unsolved problems when it comes to situation based mobile multimedia advertising:

- **Lack of standards:** It is unlikely that the number of different mobile devices will be going down in the near future. Until now, there is only little standardisation in terms of multimedia content provisioning and presentation.
- **Surroundings:** Due to e.g. high noise levels on the streets or sunshine users might be distracted from the messages.

- **Implementation of the Situation Concept:** The Situation Concept as outlined in section 2 is currently not available in mobile networks. Its implementation is a prerequisite for mobile advertising as introduced in this chapter.
- **Billing-Infrastructures:** The availability of billing-systems adapted for mobile advertising is a prerequisite to the successful application of mobile advertising concepts. So far these are not available.

The stated problems show that there are still many issues and topics that have to be addressed by research activities.

#### 4 Summary and Outlook

The Situation Concept provides the foundation to sponsor and to individualise mobile customer relationships. It is supposed to positively affect the user acceptance of mobile users towards mobile services.

The Situation Concept is also the foundation for new business models in the mobile market, where not only mobile users but also service providers become potential revenue sources for mobile network operators. It is able to leverage the potential and features of the mobile channel and to support the mobile telecommunications and advertising industry. Additionally it provides companies with an efficient and effective interaction channel to their customers.

With the availability of 3G networks at the end of this year mobile multimedia will start to compete with traditional mass media for enterprises' marketing and advertising budgets. The success of the mobile channel will definitely influence future investments in mobile networks and will therefore significantly affect the development of the information society. The Situation Concept in that context is supposed to make the interaction between mobile customers, mobile network operators as well as service providers more flexible and to provide benefits for all parties involved.

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